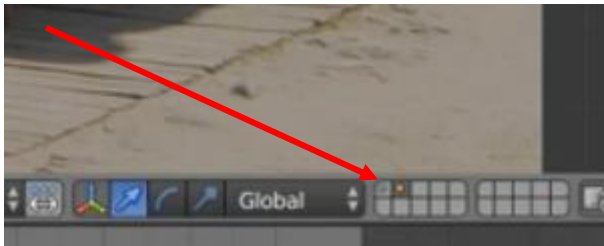


Chapter 4, lesson 44, Front framework

- We work with layers and duplicate our reference object around.
- We look at the array modifier
- We spend some time enforcing what we have previously learned and get some experience with building up objects and constructions from reference objects.
- Ambient Occlusion and Matcap is being used in this lesson.
- We learn about projecting a texture from our 3D view using the “Project from view” method.

Chapter 4, lesson 44, Front framework

In this lesson we will use the wood beam and the window frame as reference objects to duplicate around and build up the framing of the buildings front. If you have not done so already, move your objects to a separate layer by selecting them, hit **"M"** and chose the top square, second to the left. The layers are also available in the bar below the 3D view as seen in the image. Here you can select the layer you want to work with as well.

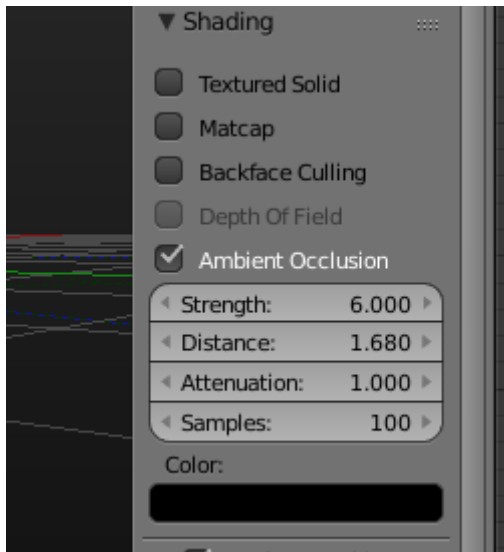


Select both the beam and the frame and hit **"shift+D"** to duplicate them. Now the duplicates will be selected, and you can hit **"M"** to move the objects back to the first layer where the base building is then go to that layer.

Go to front orthographic view and set the viewport shading to wireframe.



It can be a little bit tricky to see what line is representing what part of our object since we are able to see both the back and the front edges at the same time. If you find this confusing you can hit “N” to open the N-panel, scroll down to the Shading section and turn on Ambient Occlusion, then go into solid shading by pressing “Z”. There are four values controlling the Ambient Occlusion and you can play with them to get a slightly more contrasted view. Here is an example. Keep in mind that the Samples setting might cause performance issues with too many objects in the viewport.

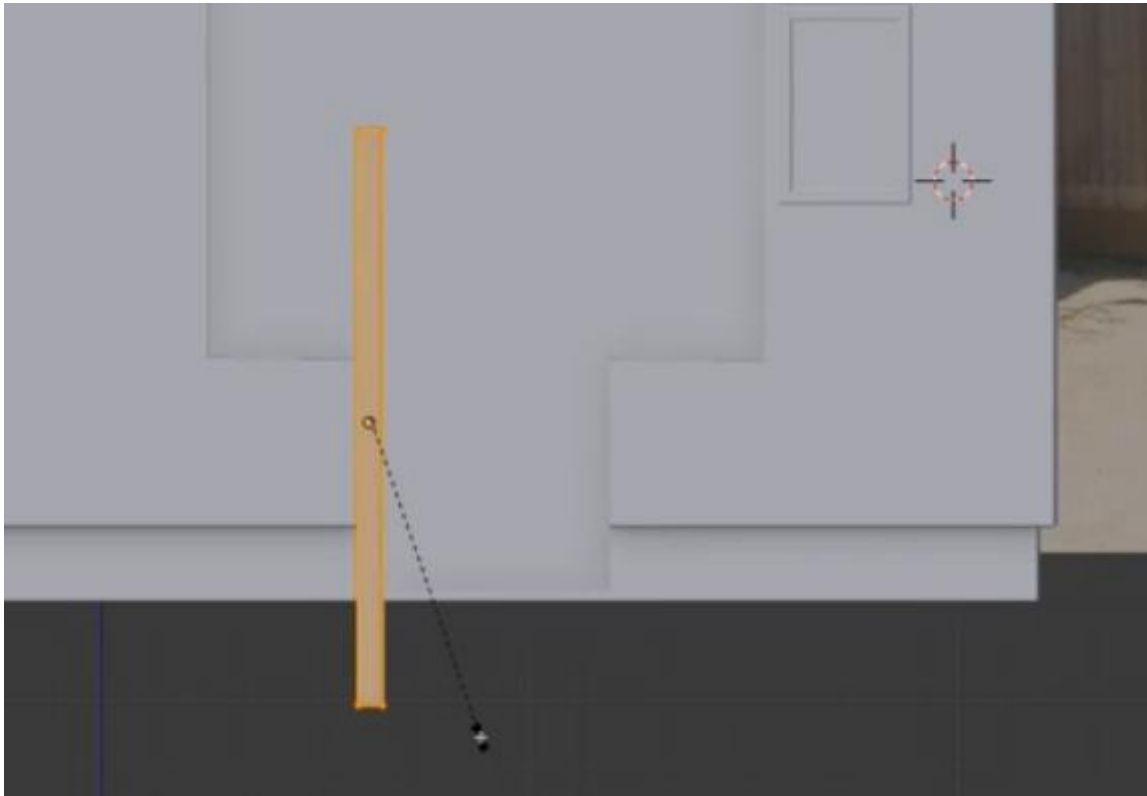


You can also try out the Matcap checkbox and select one of the matcaps from the available by clicking the image that appears below it. Some of these may be helpful to get a better understanding of what is happening in the viewport.

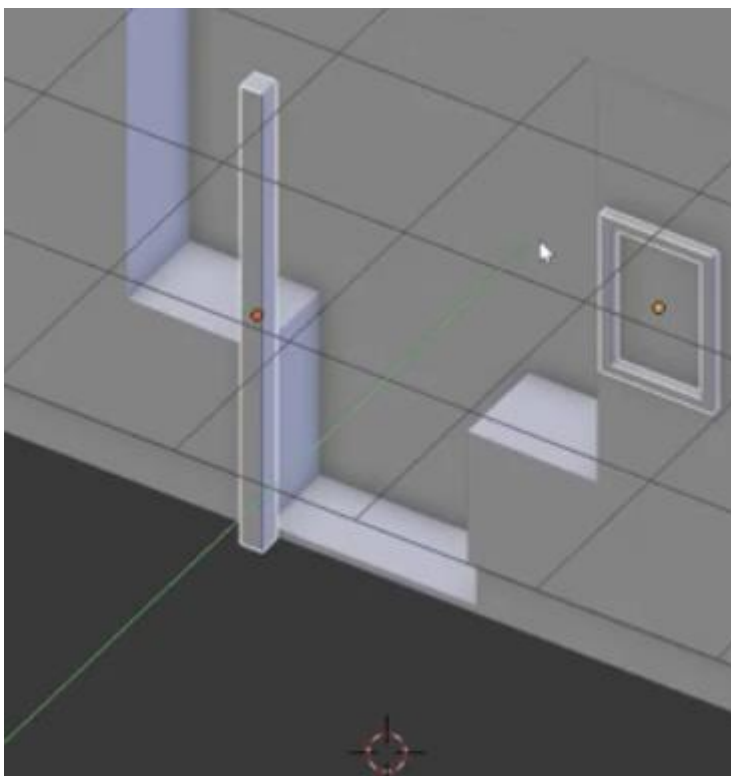
This part of the chapter is a constant dance between object and edit mode as well as rotating scaling and moving objects and its edit mode components. Therefore, we will recap the shortcuts we will mostly use here for you to refer to instead of repeatedly repeating them in the text.

Tab	Toggle between Object/Edit mode
G	Grab/Move, follow by X, Y or Z to constrain, double tap to slide
S	Scale, follow by X, Y or Z to constrain
R	Rotate, follow by X, Y or Z to constrain
B	Box select
A	Select/Deselect all
Ctrl+A	Apply rotation and scale, in object mode
Shift+D	Duplicate object, in object mode
Numpad 1	Front view
Numpad 3	Right view
Numpad 5	Toggle perspective/orthographic view

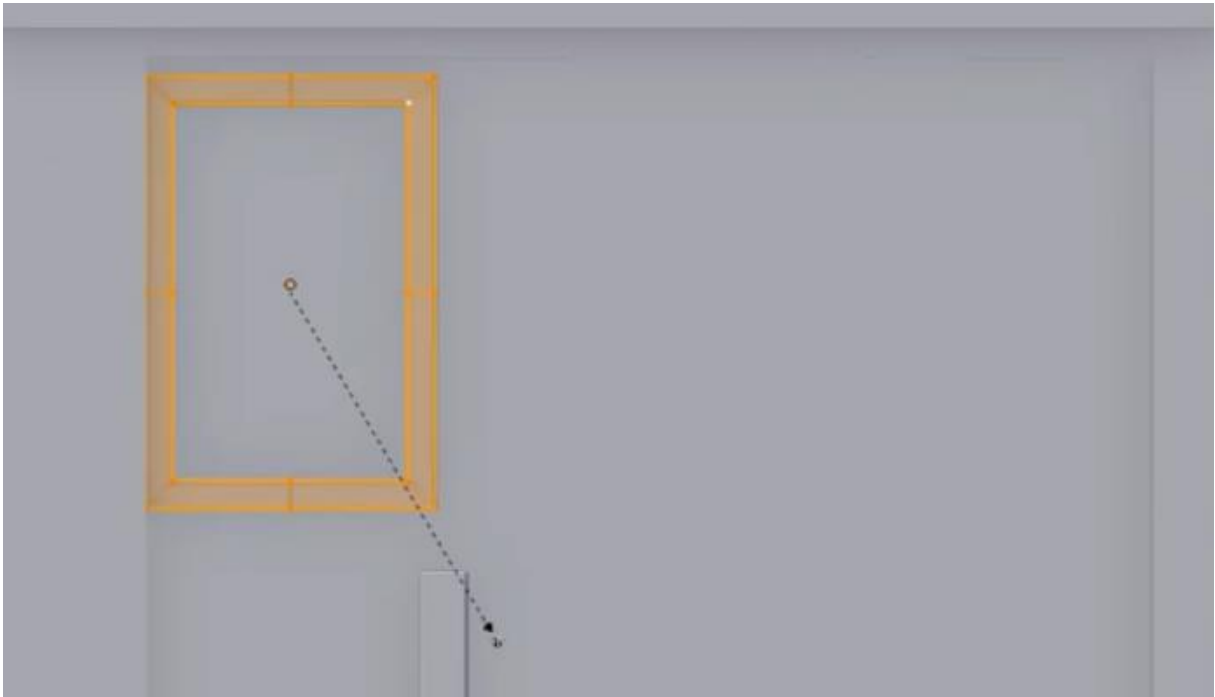
Lets now position our duplicated beam. In object mode, position the beam where the left side of the door will be. Then go into edit mode and scale it up. To scale the beam correctly you can use the hole we made for the left door to accurately measure its height, then move it over to where the main door will be. Alternatively, you can use the door on the other side of the building by selecting the building and go into edit mode and wireframe.



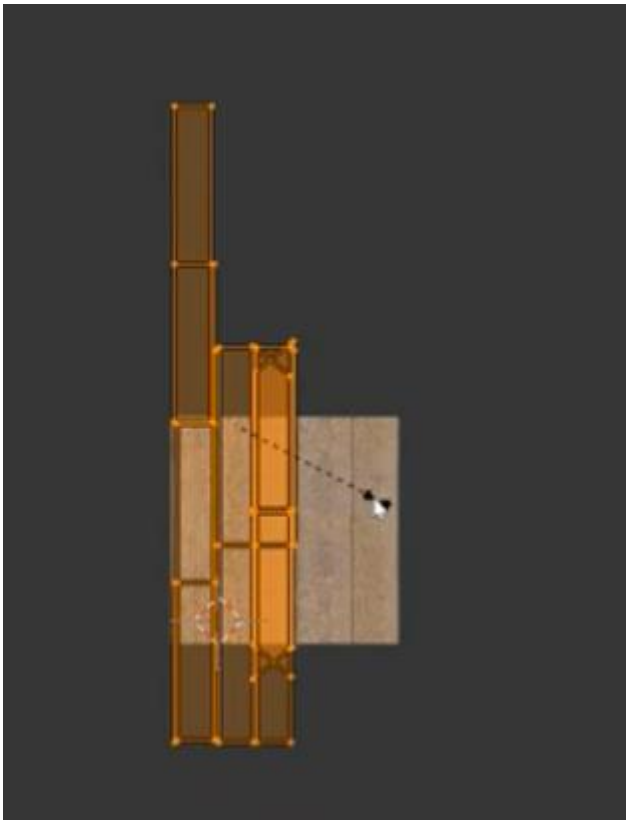
When the beam is in position, select both the frame and the beam and move them in position on the Y axis.



Massage the beam into place and compare it with the heights of the other doorframes holes as well as adjusting the width of the beam. When this is placed to your liking select the window frame and move in in line on the Z and X axis with where the top left window will be. Then scale it up in edit mode.

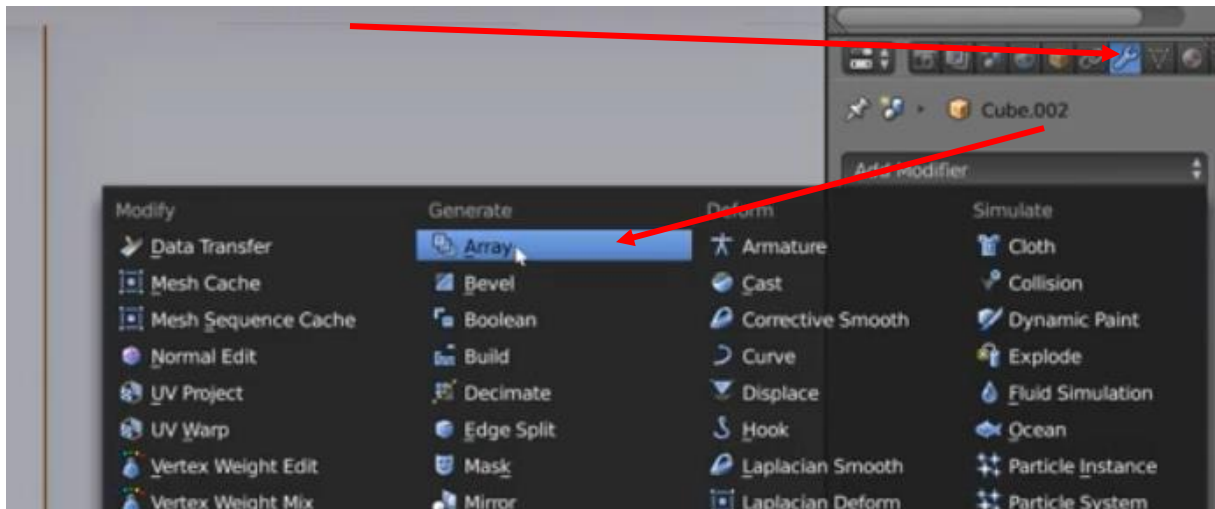


Now go into edit mode and adjust the width of the window so that we can fit all four windows in a row inside the hole. When the frame has been adjusted you most likely need to adjust the UV-map as well to avoid stretching. Go back to textured view mode and check so that the stretching is not noticeable. Use “**S**” and “**Y**” to scale only along the Y axis to avoid overlapping between multiple wood planks in the texture.

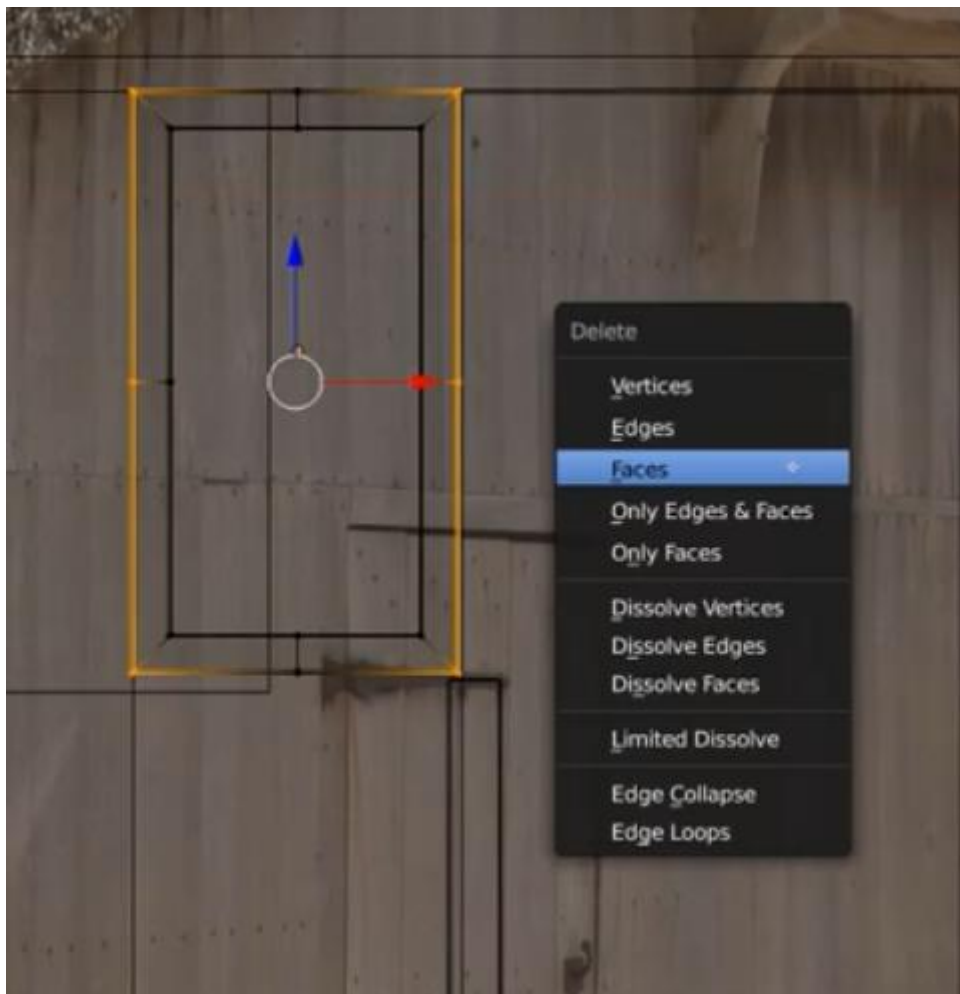


To create the other frames and avoid a dark line between them we will first create the other frames with an array modifier. Then we will delete the edges and join the window frames together. Last, we will UV-unwrap some for the faces again to avoid seams.

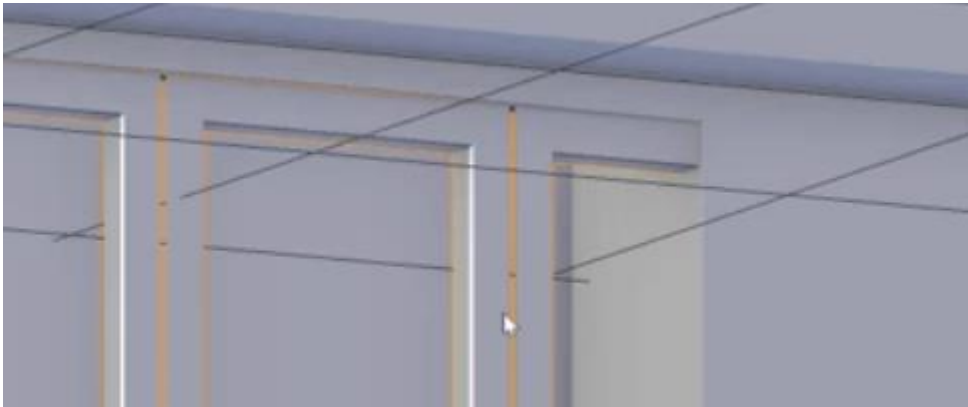
Start by going to object mode and add the array modifier to the window frame. Set the count to 4.



Then go into edit mode and delete the left and right side of the window frame.



Now there is a slight hole between the frames.



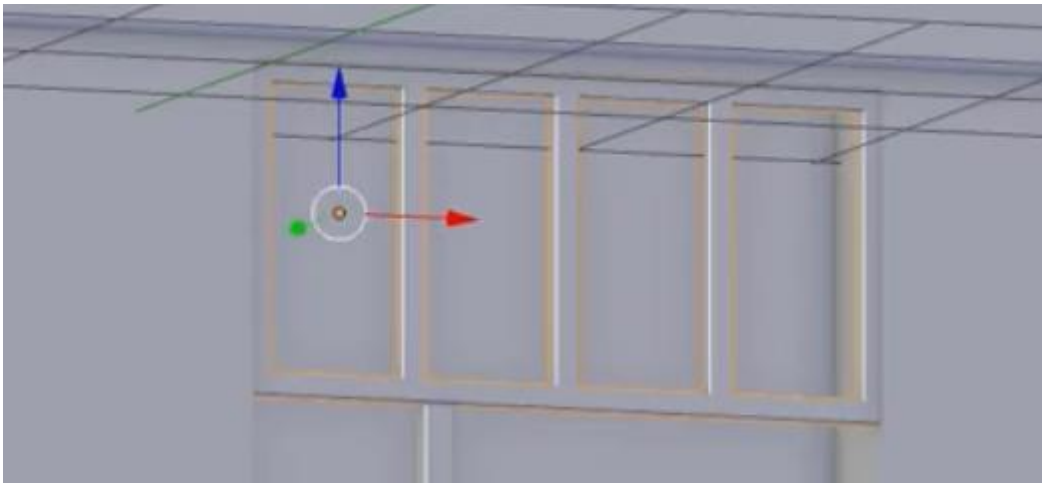
To fix this we need to align the sides on the frame so that they are perfectly in line on the X axis. This is done by selecting the side and hitting “S” and “X”, followed by “0”. Do this on both sides of the frame. This is a very useful shortcut combination that is used very often in all kinds of modelling.



Now the area between the frames will be smooth. To adjust its width, we will have to adjust both sides of the frame. Keep adjusting the windows until they are within the hole of the building base.

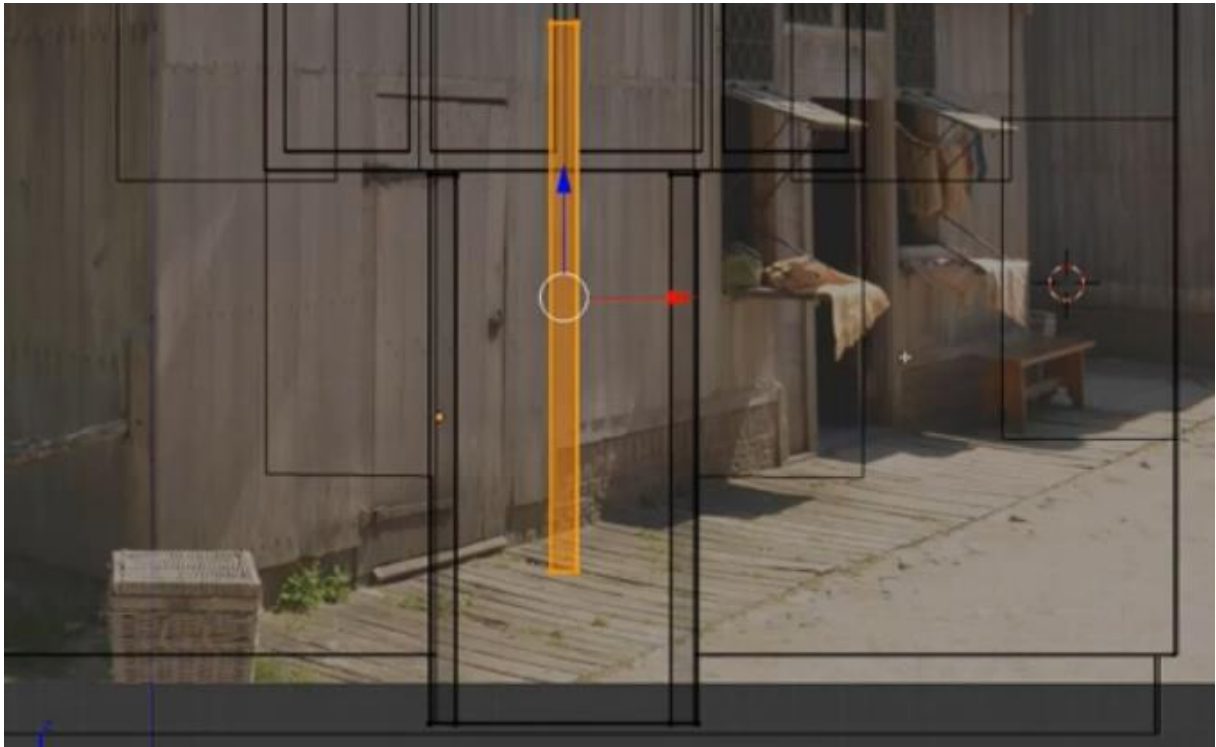


When you are happy with the sizes, apply the array modifier and adjust the outer edges of the frames.



Now go to texture mode and you may see that the texture has seams between all the frames as well as some stretching. We will adjust this shortly but for now we will build up the door frame.

Duplicate the beam over to the other side of the where the door will be. Duplicate it again and put it in the middle of the door opening.



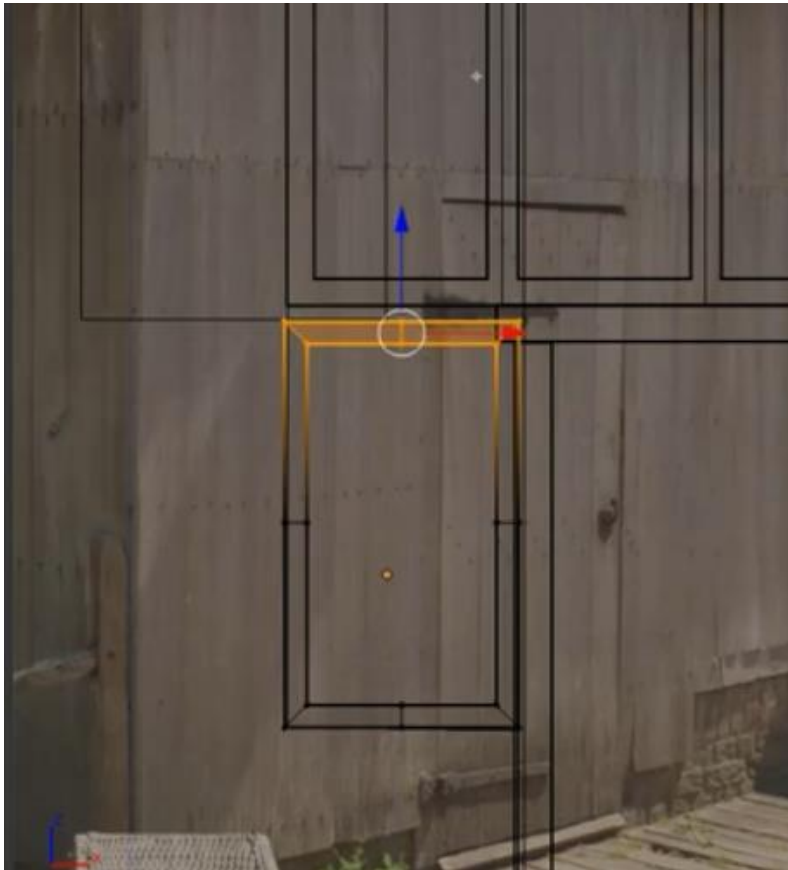
Rotate it by 90 degrees. Turn on snapping by clicking the magnet icon at the bar below the viewport. Alternatively hold “**ctrl**” to temporarily toggle snapping on while performing the rotation. Go into edit mode and adjust its length. Then move it into position.



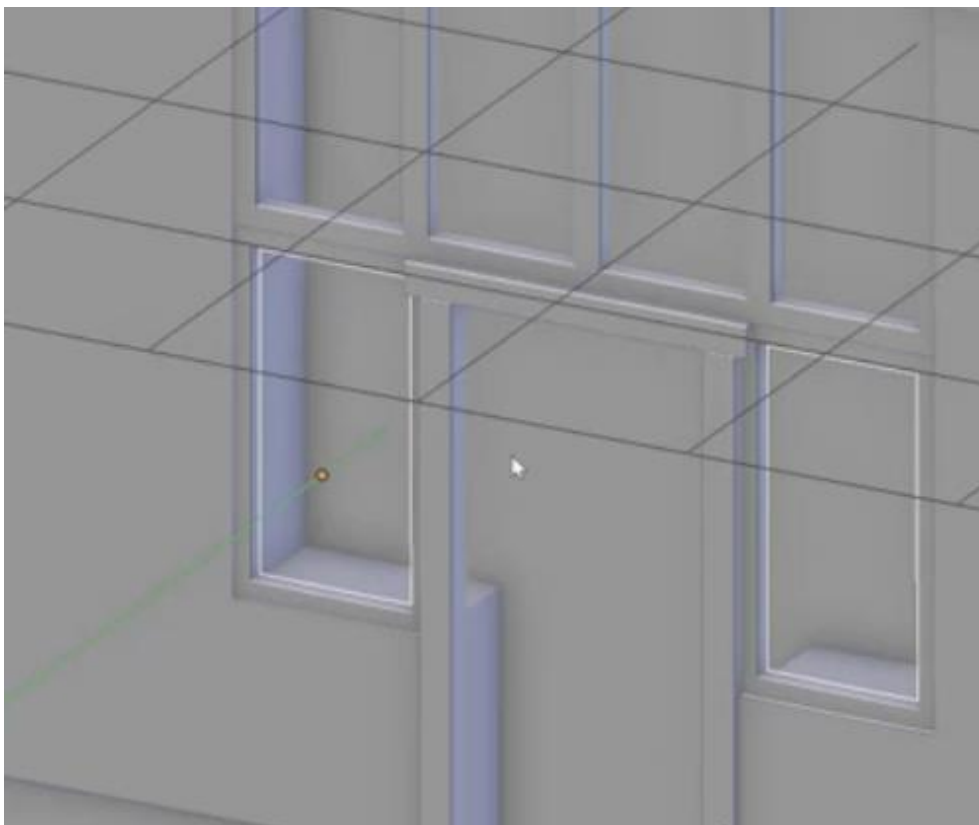
You can also lower the left and right bar to make room. As we have done before, go to texture view and make sure that your UV-coordinates is not stretched to much and adjust if necessary.

Now let’s add the window frames on ether side of the door frame. Go back to the second layer and duplicate the window frame, hit “**M**” to move it over to the first layer and drag it into position.

Scale and resize the window to fit the cut-out area that is left over for it.



Duplicate this frame over to the other side of the door and adjust the UV-coordinates of both windows. At this point you should also move the windows on the Y-axis to bring the frames slightly inside the building.

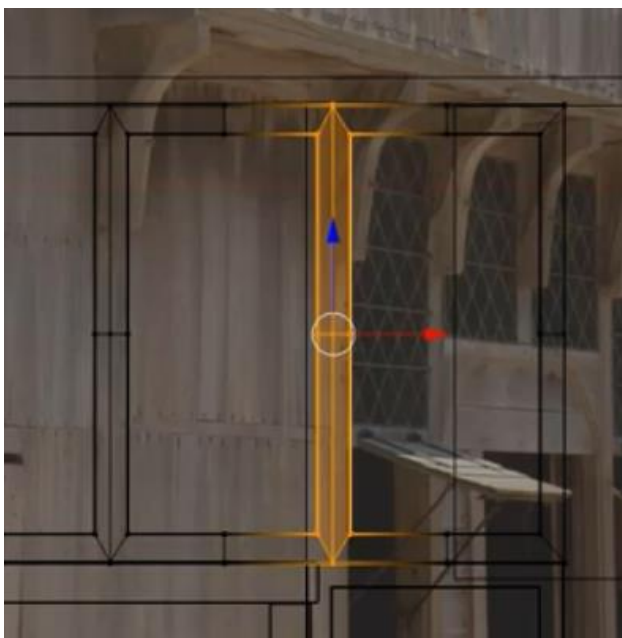


When all that is done, select the bars making up the door frame and copy them over to the hole for the side door. Then change the UV-map for this door so that they don't share the exact same texture.



Now we will go back and adjust the UV-coordinates of the top window row. Select the row and go into edit mode. Before we start, remember that one of the last thing we did here was to apply the array modifier. The array modifier creates exact duplicates of an object and in this case, it means that we have double vertices where the window frames meet. To resolve this, go into edit mode and select everything then in the tools panel under the tools tab we have a command called “Remove Doubles”. Use it to remove any vertices that share the same location.

You can select the vertices between two windows or go into face mode and select the faces if the vertices are hard to select.



From here we will explore a new UV-unwrapping alternative. If you hit **“U”** for the UV-mapping menu you can see that we have an option to select **“Project from view”**. This means that the UV-coordinates of the current selection will be projected in the UV/Image editor as we see them in the 3D view. For this to work as expected you will need to be in orthographic view or you will have a perspective on your UV-unwrapping and this is generally not desired. Scale the newly created UV-coordinates to fit the image texture.

Now you can make any last adjustments. Check the stretching, move some vertices around to make the lines more believable or adjust the Y axis position of the different frames.